

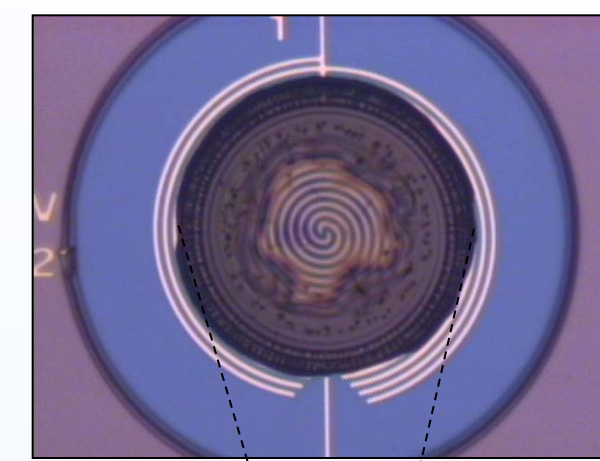
Conductive Film-MEMS Chemical Sensors for Detecting Respirator Cartridge End-of-Service Life

Jay Snyder and Tony Rozzi, NIOSH/NPPTL, Pittsburgh, PA

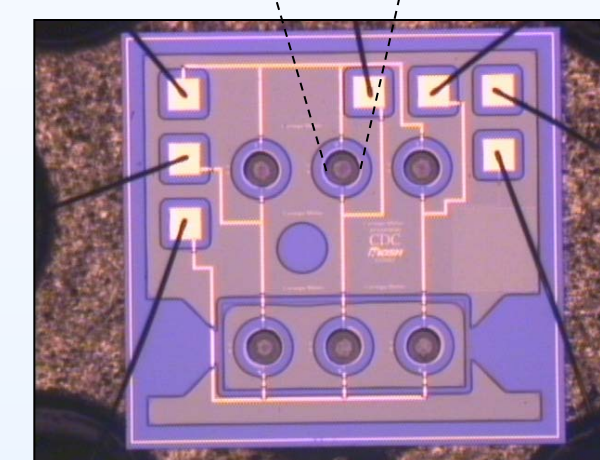
Sensor Chip



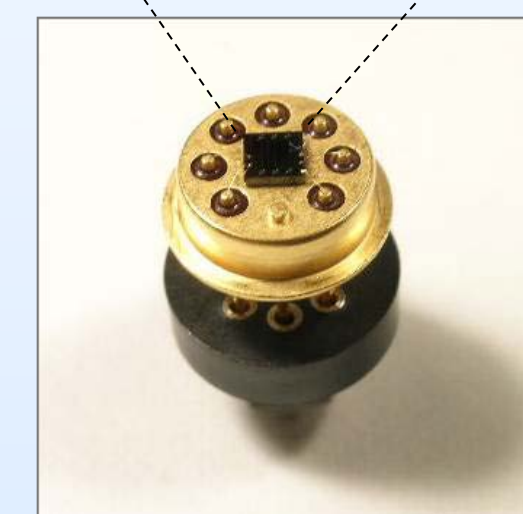
Inkjet Polymer Deposition System



Nanoparticles inkjetted onto spiral electrode

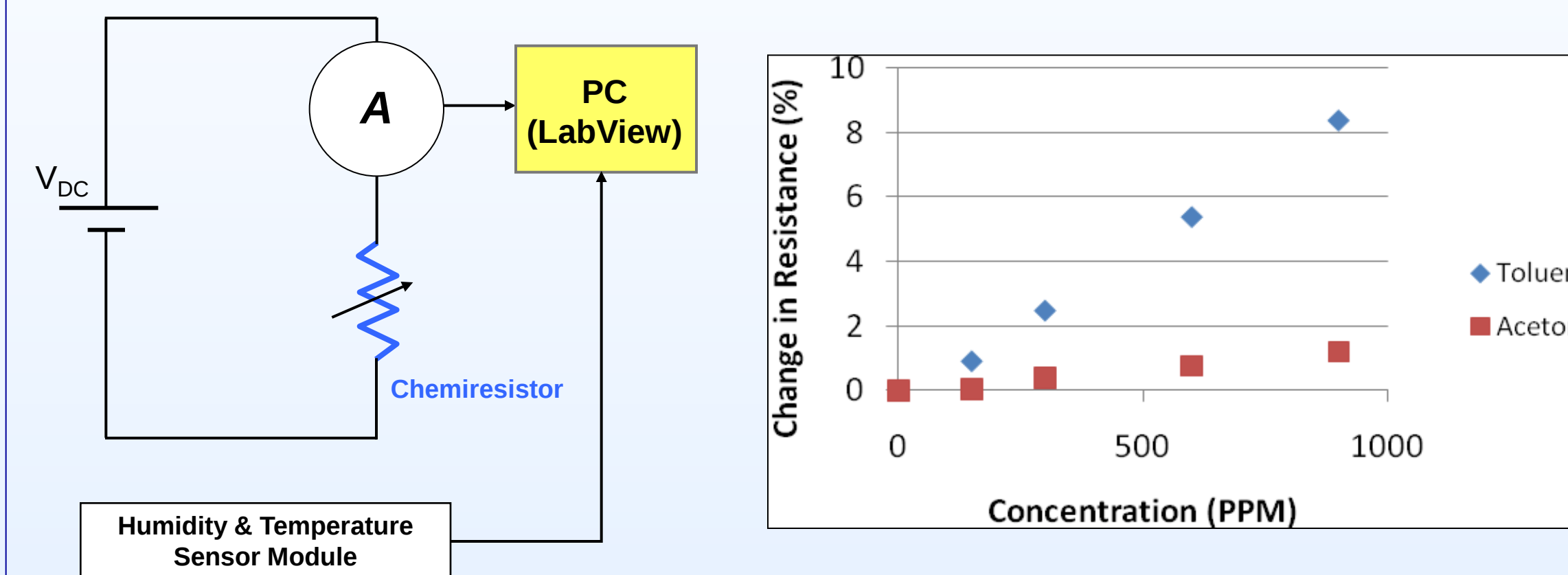


Multiple sensors per chip



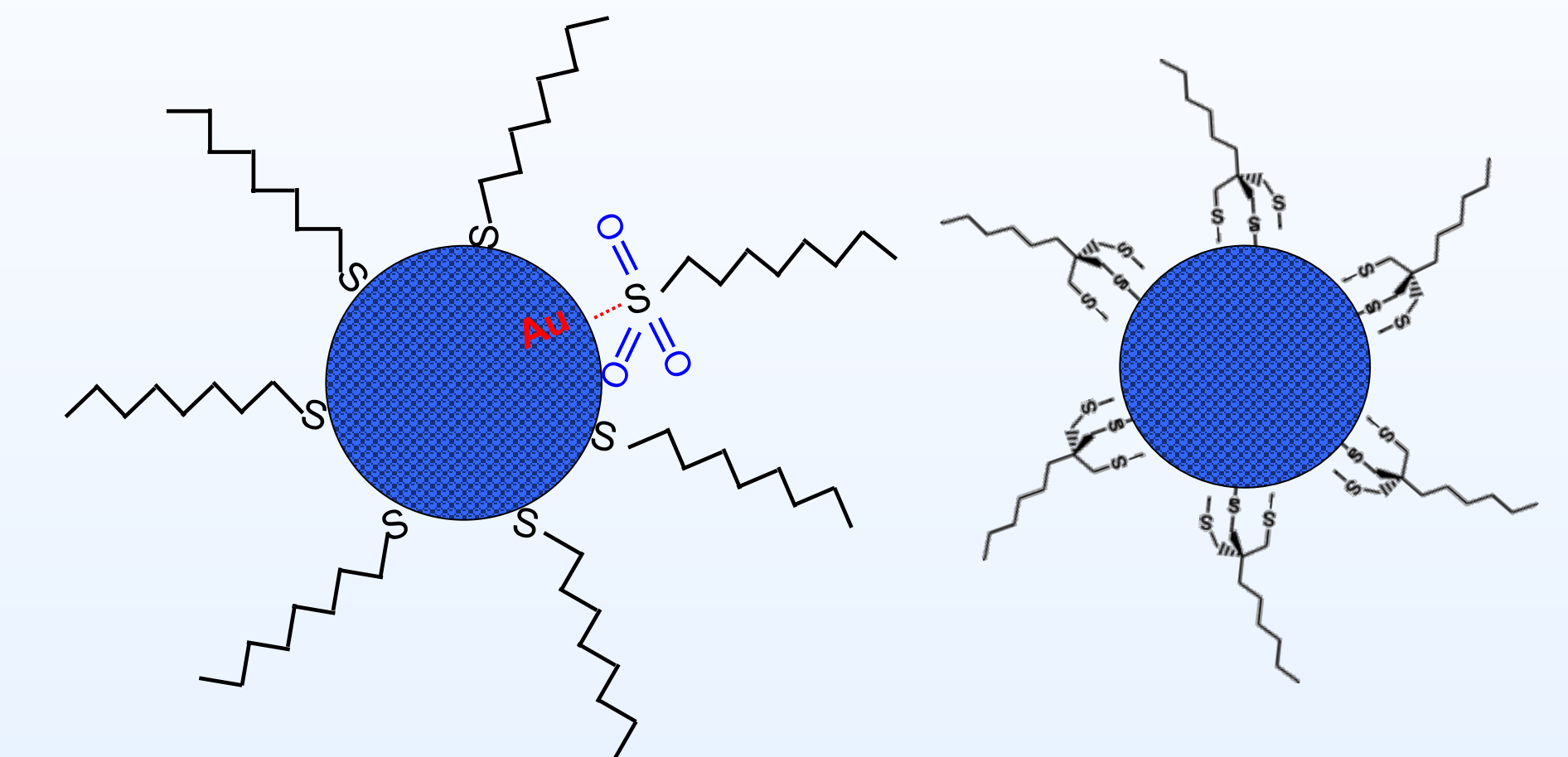
Sensor chip mounted in TO-5 package

Chemiresistor Testing



Portions of Poster Content Courtesy Carnegie Mellon University

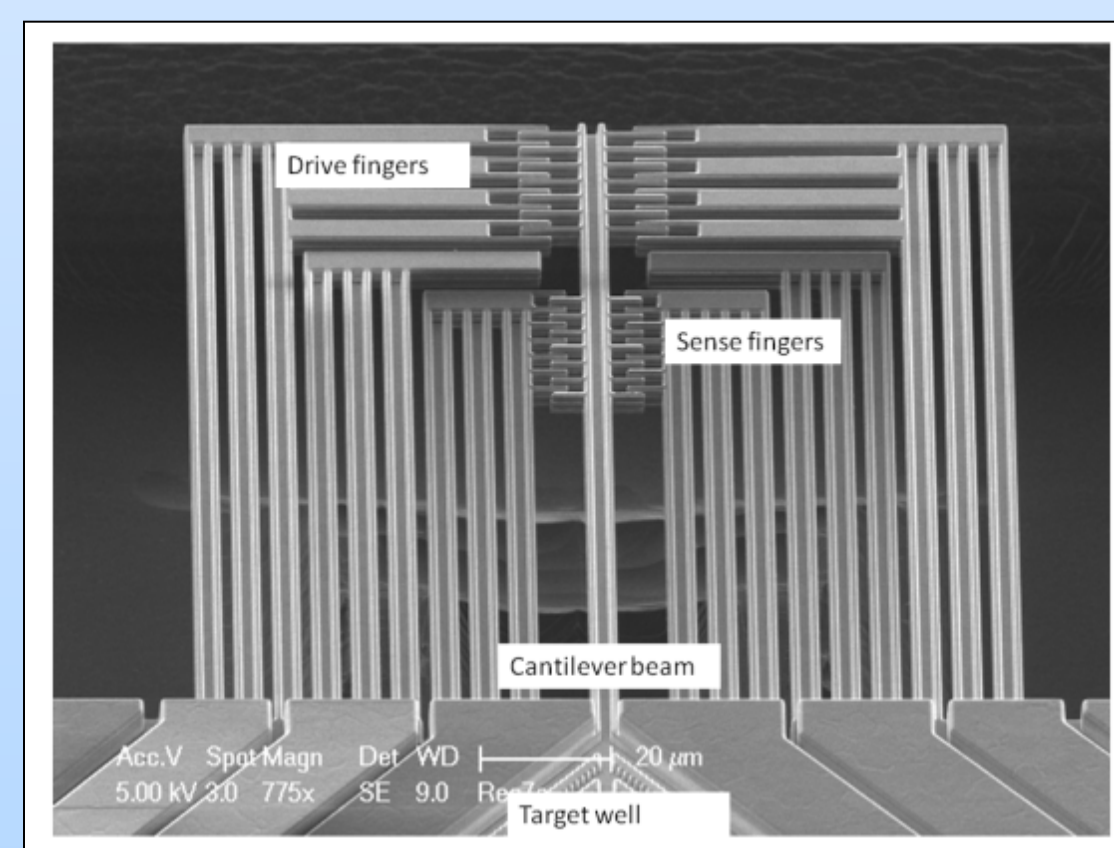
Next Generation Nanoparticles



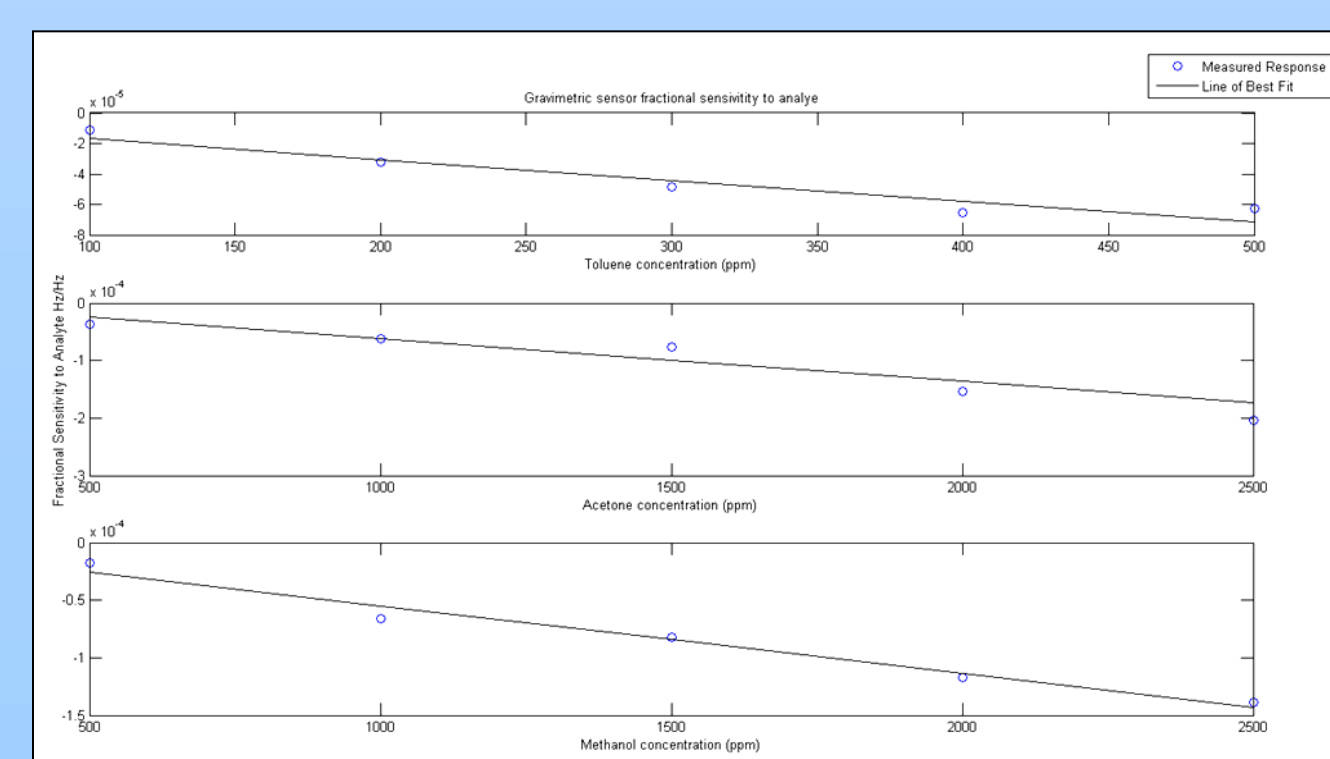
Current motif: monothiol Au NPs are susceptible to oxidation

New approach: trithiol-capped Au NPs resist oxidation

Gravimetric Chemical Sensor



SEM of micro-cantilever sensor



Performance results of micro-cantilever sensor

Analyte Preconcentrator

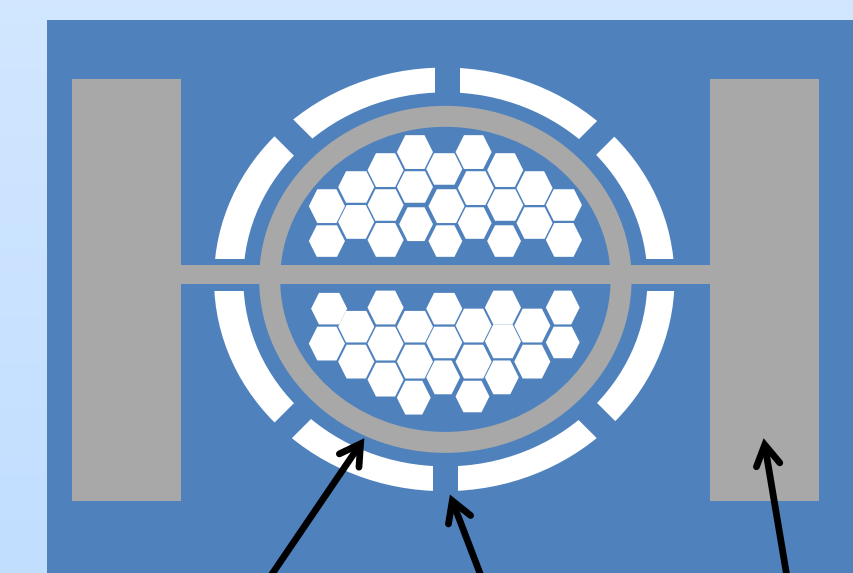
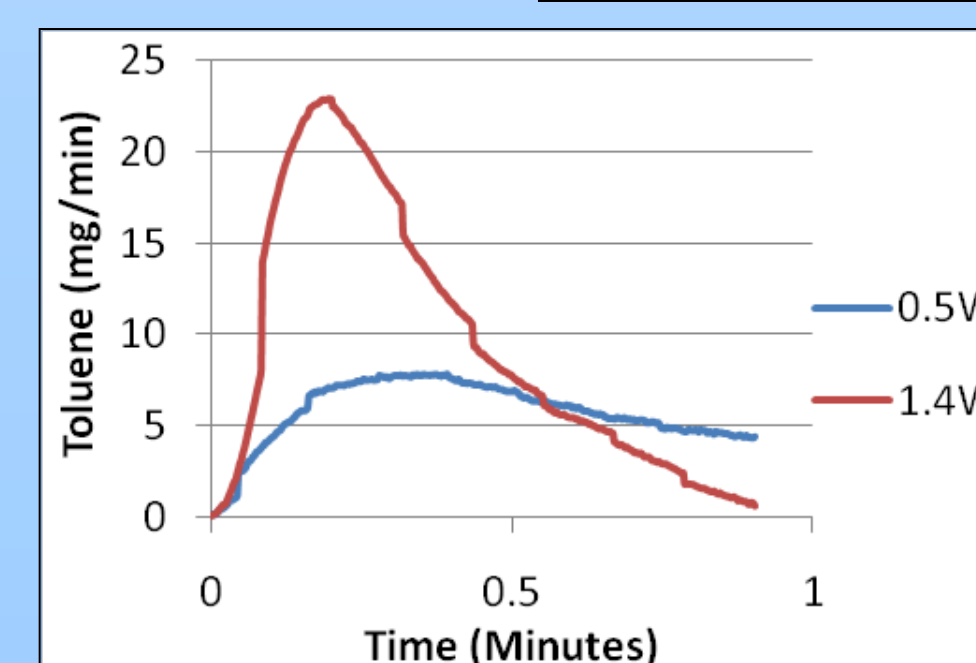
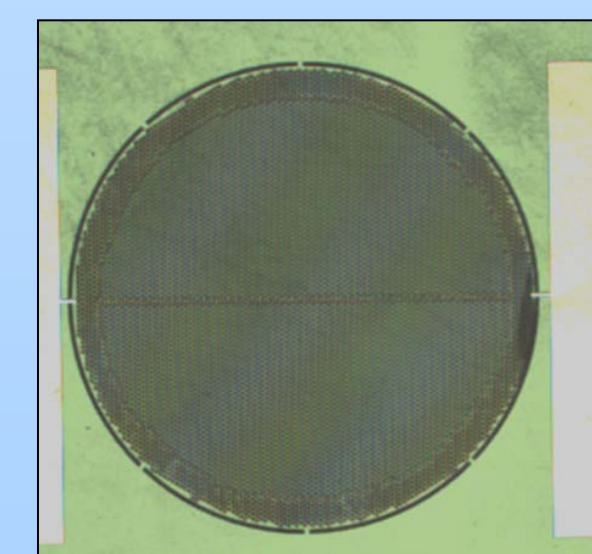


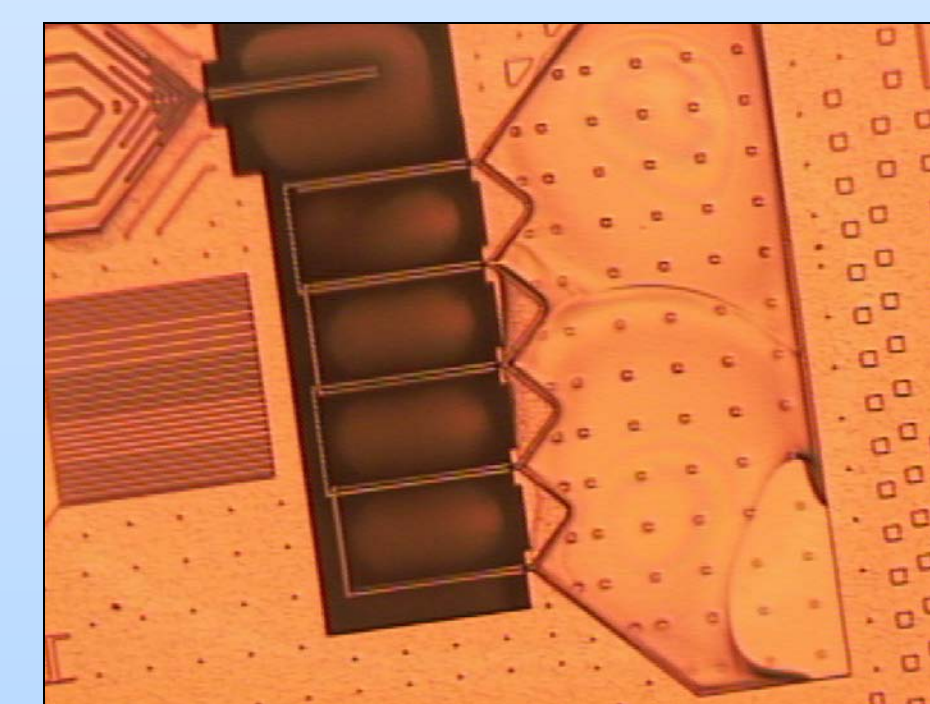
Diagram of the preconcentrator

Photomicrograph of preconcentrator

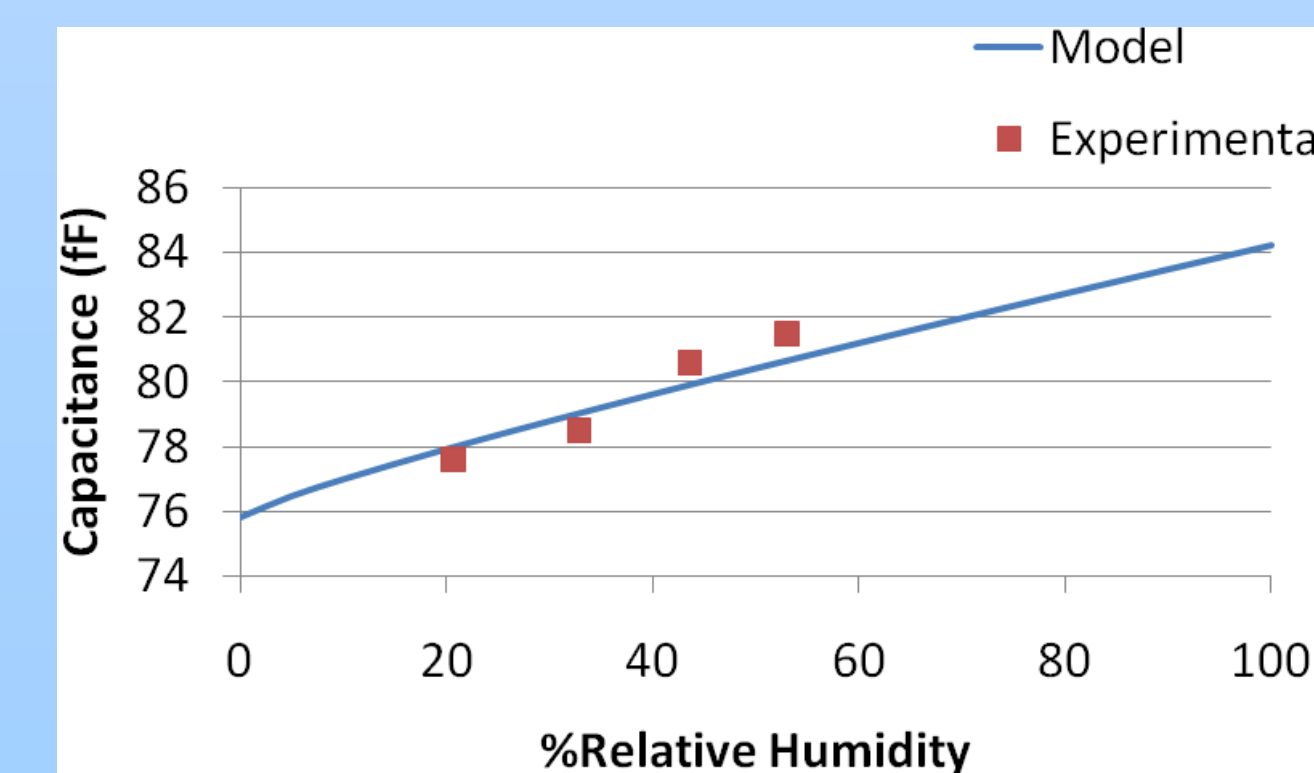


Performance results of preconcentrator

Capacitive Humidity Sensor



Photomicrograph of MEMS based capacitive sensor



Response curve

Wireless Design

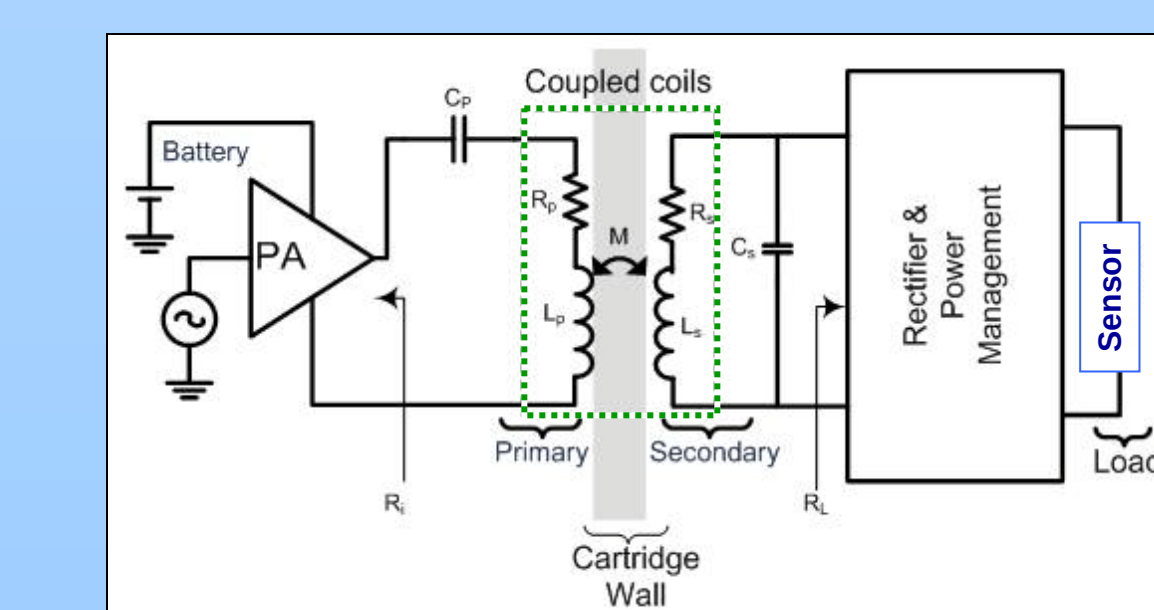
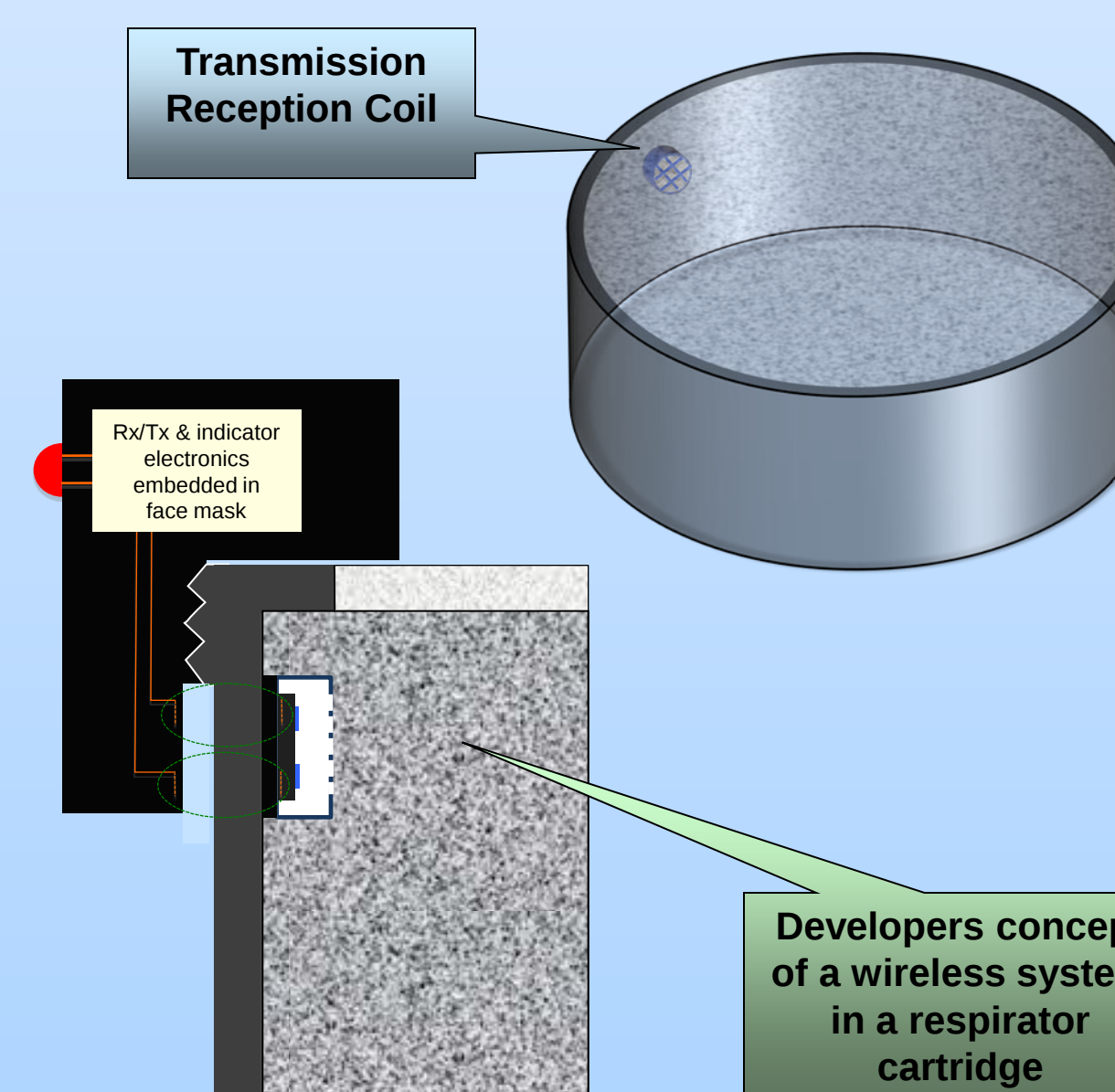
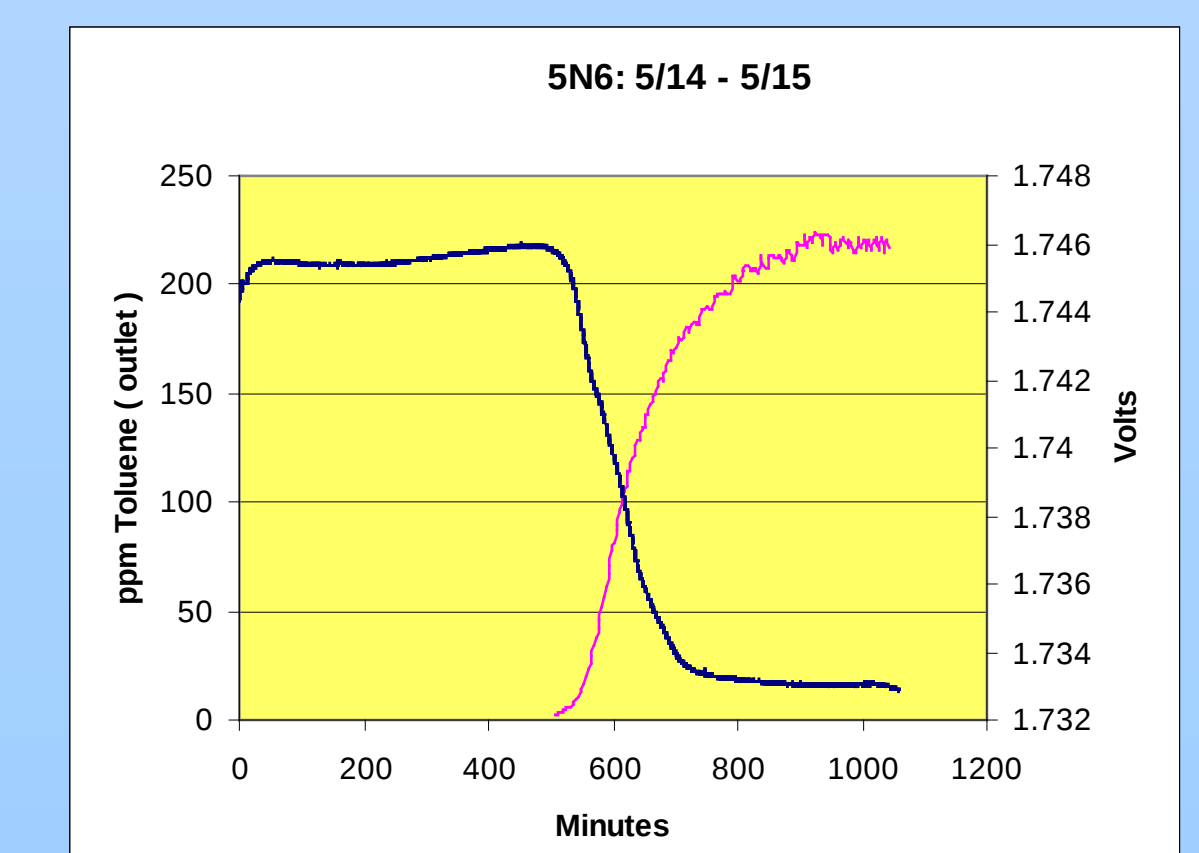


Diagram of proposed wireless system

Preliminary Cartridge Testing



Results of sensor integrated cartridge

Disclaimer: The findings and conclusions in this poster have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.